

because gold has been established by long experience to be an excellent if not ideal metal for coinage. Analysing what this means, we find that an extremely complex condition must be satisfied. We are not a stereotyped or stagnant civilisation, and the demand for coinage metal experiences great fluctuations. With the scientific awakening of last century, an enormously increased demand arose in consequence of the rapid extension of commerce. In spite of this it is of the utmost importance that the value of other commodities expressed in terms of that of the coinage-metal must remain fairly constant from year to year, otherwise debtors and creditors might awake to find themselves ruined by some great variation in the value-ratio. Experience shows that this complex condition is, as a matter of fact, nearly fulfilled for the element gold. The first requirement that gold possesses enabling it to fulfil the condition is that it is a technically worthless metal. It possesses usefulness only on account of its value. Platinum, on the other hand, is unsuited for coinage because it possesses value on account of its usefulness. In the latter case the demand increases with fall of price, while in the former it decreases.

The second requirement that has to be satisfied if the value-ratio is to remain constant is that the output of gold should, on the average, bear some fixed ratio to the amount of human endeavour expended in the search. The scarcity must be relative, and some definite number of tons of the auriferous material must on the average be extracted to produce an ounce of the metal. That is to say, the scarcity must be mainly of concentration, as in the case of radium in the uranium minerals. If a technically worthless metal is a member of a disintegration series, so that its concentration in its ores is on the average fixed, it would obey the complex condition required for a coinage metal. So that the argument may be inverted, and indirect evidence obtained that gold is, like radium, a member of a disintegration series. The gold currency cost the world seventy million pounds worth of unproductive labour last year. A sum, which expressed in pounds runs into ten figures, representing the world's accumulated stock of bullion, has been spent in the past. To-day it exchanges at its face-value; to-morrow, with the introduction of a less expensive and more scientific system of book-keeping, it will become a mass of technically worthless metal.

This extension of the idea of atomic disintegration shows how powerfully the recent theories are bound in time to affect the life and thought of the community. Those who have grasped their significance know well that nothing appears the same or can again appear quite the same as before. It is not necessary that we should ever approach nearer than at present to the control and application of the new processes and reservoirs of energy. The mere possibility of being able to do so in the future cannot fail to leave its mark. By these discoveries the relation of mankind to nature has undergone a certain change, and man has caught a glimpse of some latent possibilities within his legitimate destiny which cannot be effaced. Energy is the life of the physical universe. You cannot multiply the existing store by a million and leave things as they were. Man, "nature's rebel," as Prof. Ray Lankester has depicted him, left isolated among the forces of nature to work out his own salvation, has had placed before his eyes a new material destiny. So far as physical possibility is concerned, he may one day attain to the power as well as the wish expressed in the quatrain of Omar:—

"O love I could you and I with fate conspire
To grasp this sorry scheme of things entire,
Would not we shatter it to bits—and then
Re-mould it nearer to the heart's desire!"

MEDICAL INSPECTION AND FEEDING OF CHILDREN IN SCHOOLS.¹

WE welcome this extension of the inquiry begun in the physical deterioration report, however limited be the terms of reference, viz. (1) to report on what is being done, and with what result, in respect to medical inspection; (2) to inquire into the methods employed, the sums

¹ Report of Interdepartmental Committee on Medical Inspection and Feeding of Children attending Public Elementary Schools. (Cd. 2779.) Price 1s. 3d.

expended, and the relief given by various voluntary agencies for the provision of meals, and to report whether relief of this kind could be better organised without any charge upon the public funds.

(1) Upon the first subject, the results are shown to be most beneficial, the percentage of sufferers being by no means small; thus in defects of vision found in 7 per cent. to 20 per cent. of children examined, headache and apparent dulness often disappear. Twenty per cent. seems a common experience of the incidence of vermin, uncleanliness, and ringworm; here beneficial results have been generally of a marked character, cases being diminished by one-half in nine months in Gloucestershire.

The medical officer of health at Salford demonstrates to the teachers the symptoms to expect in infectious diseases, and the teachers are becoming so skilful in detecting symptoms, and at once excluding all suspected cases, that outbreaks of infectious disease demanding medical inspection are much less frequent. So will necessity for closing the schools diminish.

Diphtheria, it is stated, is now in several areas under such complete control that it can be stopped in a few days. We read in this and similar evidence an urgent call for the extension of medical inspection, and regret that the committee should water their conclusions with a comment that the "results" are to be given as statements of opinion rather than as ascertained facts. The contrary is the case, the facts are ascertained, and if the dozen witnesses coincide, surely we have progressed beyond opinion.

(2) In the second inquiry, in which the committee is to report whether relief can be better organised without any charge upon the public funds, much valuable sociological information has been collected. In many schools 2 per cent. to 5 per cent. of children require this aid, and a meal may cost from a penny to twopence. Seventeen recommendations outline business-like cooperation for charitable relief.

The committee has stated that in the ordinary run of cases which will come up to be dealt with, a woman's opinion upon the need of a household will be more valuable than a man's, and the opinion of two lady witnesses is given that the existing attendance officer is not sufficiently trained, and therefore of no use for the purpose. One would imagine a recommendation would follow that a lady official should be secured for this primary duty of selection of recipients. This omission does not seem explicable on financial grounds, for it might as readily be a charge upon voluntary subscription as upon the public funds. One feels that without such aid the frequent abuse of free meals, as reported in the evidence, is likely to recur.

In this inquiry, all who seek to avoid pauperising parents on the one hand, or the underfeeding of school children on the other, will find much useful information.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—By the will of the late Sir J. S. Burdon-Sanderson, the laboratory of the pathological department of the University is bequeathed the sum of 2000l., payable within six months of his death, as an endowment to provide for pathological research there, the fund to be vested in the professors for the time being of human anatomy, physiology, and pathology, who are to have absolute discretion as to the application of the fund.

CAMBRIDGE.—Last Sunday completed the fiftieth year during which Dr. Atkinson has presided as Master over the fortunes of Clare College, and the University will on February 1 present him with an address of congratulation similar to that presented to the late Lord Braybrooke two years ago.

Mr. H. O. Jones, of Clare College, has been approved as deputy for the Jacksonian professor of experimental philosophy during the current Lent term.

The following awards to scholarships in mathematics have been made at Queens' College:—N. R. Krishnamma, Merchant Taylors', 45l.; C. F. Waterfall, Manchester Grammar School, 45l.; A. H. Pinder, Malvern College,

40l.; H. C. Bathurst, Dulwich College, 40l.; E. T. Lancaster, Exeter School, 30l.; G. D. Roebling Winchester College, 30l.

THE death is announced, at the age of forty-nine, of Dr. W. R. Harper, president of Chicago University.

THE council of the University of Sheffield has appointed Dr. Louis Cobbett professor of pathology, and Mr. L. T. O'Shea professor of applied chemistry in the University.

SIR MICHAEL FOSTER, K.C.B., F.R.S., will preside at the meeting of the Public Schools Science Masters' Association at Westminster School on Saturday, January 20, in place of the president, Sir Oliver Lodge, F.R.S., who is prevented from being present.

WE learn from *Science* that at the recent special session of the State legislature the University of Wisconsin was again authorised to draw its income from the general fund of the State treasury, as according to the new method of appropriating funds for the university by setting aside two-sevenths of a mill on all taxes, the university income fund does not become available until February each year, whereas the university budget has always been estimated on the basis of the fiscal year, which extends from July 1 to June 30 of each year.

ON Saturday, January 13, the first annual dinner was held of the past chemical students of the Technical College, Finsbury. Prof. R. Meldola, F.R.S., took the chair, and there were present, in addition to the lecturers and demonstrators of the chemical department, seventy past students of the college. Prof. Meldola referred with pride to the number of past students, who had won distinction in the chemical world, and were gathered around him. Finsbury was one of the earliest technical colleges, and had a record of a quarter of a century's usefulness to the technical industries of the country. Dr. Moody, who proposed "The College," said that this year was a very appropriate one for the first annual dinner, as their head, Prof. Meldola, now held the highest distinction the Chemical Society had to offer, the office of president.

A DISCUSSION has been opened in *L'Enseignement mathématique* on the reforms to be accomplished in the teaching of mathematics, and numerous mathematicians have been asked to state their opinions on the conditions that should be satisfied by a complete course of mathematics, theoretical and practical, in institutions of higher grade. The questions are as follows:—What improvements should be effected in the teaching of pure mathematics? What part should be played by higher educational institutions in preparing teachers for secondary schools? And how should mathematical teaching be organised in order that it may respond better than hitherto to the requirements of other branches of pure and applied science? Of those who have already taken part in this referendum, we note the names of Prof. Gino Loria (Genoa), Prof. Emile Borel (Paris), Prof. Jules Andrade (Besançon), Prof. D. E. Smith (Columbia University), Prof. F. Mariotte (Paris).

SOCIETIES AND ACADEMIES. LONDON.

Royal Microscopical Society, December 20, 1905.—Dr. Dukinfield H. Scott, F.R.S., president, in the chair.—An exhibit consisting of about twenty photographs of diatoms taken by the Zeiss apparatus, designed by Dr. August Köhler, of Jena, for photomicrography with ultra-violet light: Mr. **Rheinberg**. The objective and other lenses used in taking the photographs were made wholly of fused quartz, which rendered possible the utilisation of ultra-violet light having a wave-length of 275 $\mu\mu$ (=275 millionths of a millimetre). The photographs were taken with a 1.7 mm. monochromatic objective of 1.25 N.A., using light from the cadmium spark. The resolving power was therefore as great as would be that of an objective used with ordinary light if it were possible to give it an N.A. of 2.5. There were photographs of *Surirella gemma* and *Amphipleura pellucida*; one of the latter taken with oblique illumination showed the diatom clearly resolved into dots. There were also comparison photographs of the same diatoms, taken with a 2 mm.

apo-chromatic objective of 1.4 N.A. using light from the magnesium spark ($\lambda=383 \mu\mu$) giving about the same amplification, viz. about 1800 diameters. The difference in the appearance of the images was very apparent.—A fern fructification from the lower Coal-measures of Shore, Lancashire: D. M. S. **Watson**.

Linnean Society, December 21, 1905.—Mr. C. B. Clarke, F.R.S., vice-president, in the chair.—(1) An aposporous seedling of *Polypodium vulgare*, with a frond bearing a well defined prothallus at the tip. (2) A new case of apospory in *Cystopteris montana*: C. T. **Druery**.—The International Botanical Congress at Vienna in June last: Dr. A. B. **Rendle**. A report was given on the work of the congress, and in particular on the proposals of the conference on botanical nomenclature (see *NATURE*, vol. lxxii., p. 272, 1905).—*Cyrtandra Malaya insularis novæ*: Dr. F. **Kräzlin**.—On Characeæ from the Cape of Good Hope collected by Major A. H. Wolley-Dod, R.A.: H. and J. **Groves**.

Mathematical Society, January 11.—Prof. Forsyth, president, in the chair.—On the monogeneity of an algebraic function: Dr. H. F. **Baker**.—On the diffraction of sound by large cylinders: J. W. **Nicholson**.—On the expression of the so-called biquaternions and triquaternions by quaternary matrices: J. **Brill**.—Dr. E. W. **Hobson** made an informal communication on the representation of functions of real variables.

PARIS.

Academy of Sciences, January 8.—M. Poincaré in the chair.—On a method allowing of the determination of the constant of an absolute electrodynamometer with the aid of an induction phenomenon: G. **Lippmann**. In the determination of the constant of an absolute electrodynamometer, the conditions imposed by the calculation if accuracy of measurement is aimed at are the opposite of the conditions for sensitiveness. In the method proposed in the present paper, the experimental measurement is reduced to finding the equilibrium position of a galvanometer, and measuring either an angle or a length.—On comets, and the curvature of their solar trajectory: Émile **Belet**.—On plane transformations: M. **Hadamard**.—On the non-stationary motion of a fluid ellipsoid of revolution which does not change its figure during the motion: W. **Stekloff**.—On the stability of aero-planes and the rational construction of supporting planes: Édmond **Seux**.—On the variation of the emission spectra of some electric lamps with temperature: P. **Vaillant**. The lamps studied were the Cooper-Hewitt mercury lamp, the tantalum filament, the Nernst, and the ordinary carbon filament lamps. Figures are given showing the variations in the composition and intensity of the light with the number of watts consumed by each lamp.—On a new type of compound in the group of rare metals: C. **Matignon** and E. **Cazes**. At a high temperature samarium chloride, SmCl_3 , is slowly reduced in a current of hydrogen to a lower chloride, the analyses agreeing with the formula SmCl_2 . This lower chloride was obtained by other methods, the complete absence of moisture being the one condition essential. The chlorides of praseodymium and neodymium do not undergo a similar reduction by hydrogen.—The electrolytic preparation of spongy tin: D. **Tommasi**. The electrolytic solution is made up of stannous chloride (10), hydrochloric acid (1), and water (50), and the tin is deposited on a rotating cathode.—On cuprous-silicide: Em. **Vigouroux**. The author has repeated and confirmed his earlier experiments on this subject, and shows that in pure silicides of copper the amount of combined silicon is about 10 per cent.; the crystallised cuprous silicide, Cu_2Si , has been isolated and its principal properties determined.—The reduction of the chlorides of silver and copper by calcium: L. **Hackspill**. The reduction of silver chloride by calcium gives rise to a series of alloys of calcium and silver varying according to the proportion of calcium used. The reduction of cuprous chloride gave similarly a copper-calcium alloy.—Asymmetrical derivatives of 1:6-hexanediol; the diethyl ether and di-iodide of 1:7-heptanediol: R. **Dionneau**.—On the conditions of hydrogenation of some halogen derivatives of fatty hydrocarbons by the metal ammoniums. The preparation of ethylenic and acetylenic hydrocarbons: E. **Chablay**. Sodium, dissolved in liquid ammonia, acts